ERIOPHYID MITES—NOTES AND NEW SPECIES
(Acarina)

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The following additions to the mite fauna of California not only add seven species to the State list but also implicate five new hosts.

Aceria pynocephalae Keifer, new species

(Figures 1 da, 1 es, 1 f)

Female 160–220μ long, 45–50μ thick; wormlike; color whitish-yellow. Rostrum 25μ long, projecting forward and down. Shield 30μ long, 35μ across, subtriangular; design clear: median line complete or broken; admedians extending full length and curving centrad to rear; first submedian lines curving toward and ending at about 2/3 of the admedians; second submedians represented by disconnected curved lines ahead of the dorsal tubercles; third submedians extending diagonally along the upper edge of the lateral granulations. Dorsal tubercles 24μ apart on the rear margin; dorsal setae 35μ long, projecting backwards. Forelegs 35μ long, tibia 7μ long, with seta; tarsus 8μ long, claw 11μ long, slender, tapering; featherclaw 5-rayed. Hindlegs 30μ long, tibia 6μlong, tarsus 8μ long, claw 11μ long. Coxae with granulations and lines, the anterior coxae broadly connate. Abdomen with 80–85 rings; completely microtuberculate, the microtubercles a little elongate and pointed; microtubercles smaller on cauda. Lateral seta 26μ long, on ring 12; first ventral seta 55μ long, on about ring 27; second ventral 15μ long, on ring 45; third ventral 23μ long, on ring 6 from rear. Accessory seta present. Female genitalia 21μ wide, 16μ long, coverflap with 12–14 longitudinal furrows; seta 15μ long.

Male not seen.

Type locality: SAN FRANCISCO, CALIFORNIA. Collected: Aug. 3, 1952 by the writer. *Host: Artemisia pycnocephala* DC. (Compositae). *Relation to host:* The mites live in the buds, especially the flower buds which grow in tolerably long spikes. No damage by the mite has been noted although the mite population is considerable. *Type material:* A type slide and five paratype slides bear the above data.

On page 14 of Vol. 2, No. 1 of the Bull. Calif. Insect Survey the new species runs to *calibaccharis* (Keifer) in the key. However, *pycnocephalae* has a shortened first submedian line whereas *calibaccharis* has a full length first submedian line.

Aceria sphacelina Keifer, new species

(Figures 2 da, 2 es, 2 f)

Female 140–180μ long, 40–45μ thick; wormlike; light amber in color. Rostrum 25μ long, curved down. Shield 25μ long, 30μ wide, noticeably

humped to rear; design distinct with the median line somewhat broken and ending in a dart-shaped mark; admedians undulating slightly, gradually diverging, hardly recurving at rear; first submedians indistinctly forked in front of tubercles, the second submedians shorter; third submedians along upper edge of lateral granular area. Dorsal tubercles 23μ apart, on rear margin; dorsal setae 26μ long, projecting backward. Forelegs 27μ long, tibia 5.5μ long, with seta; tarsus 7μ long, claw 10μ long, tapering; featherclaw 4-rayed. Hindlegs 23μ long, tibia 4.5μ long, tarsus 6μ long, claw 9.5μ long. Coxae slightly marked, the anterior coxae broadly connate. Abdomen with 65–70 rings; completely microtuberculate, the microtubercles each extended into a short spinule. Lateral seta 23μ long, on about ring 8; first ventral seta 38μ long, on about ring 21; second ventral 13μ long, on about ring 38; third ventral seta 19μ long, on about ring 6 from rear. Accessory seta present. Female genitalia 18.5μ wide, 10μ long, coverflap with 10–12 longitudinal furrows; seta 10μ long.

Male not studied.

Type locality: THREE MILES WEST OF SHINGLE SPRINGS, EL DORADO COUNTY, CALIFORNIA. Collected: June 29, 1952, by the writer. *Host: Sphacele calycina Benth.* (Labiatae, Pitcher sage. *Relation to host:* The mites live around the small leaves as they emerge from the bud; also within the peiole bases. No damage to the host has been noted. *Type material:* A type slide and six paratype slides bear the above data.

This mite is also found in the Paradise region of Butte County, the collection July 7, 1939, by the writer. None of these specimens are now on hand. In the key to California species of *Aceria* (cited above) this mite runs to *Aceria chrysopsis* (Keifer), but differs in not having recurved submedian lines. *Aceria sphacelina* differs from *Aceria neosalviae* (Keifer) by possessing spinuliferous microtubercles, as well as other features.

Aceria populinquis Keifer, new species

(Figures 3 da, 3 es, 3 f)

Female 200–240μ long, 55μ thick, wormlike, tapering; color yellowish-white. Rostrum rather large, 38μ long, curving down. Shield 36μ long, 46μ wide; design very faint: a short median line to rear, with the admedians apparently extending full length, and connected to the anterior end of the median by diagonal lines at the 2/3 point on the shield; lateral granular area present. Dorsal tubercles 35μ apart, on rear margin; dorsal setae 36μ long, projecting caudad. Forelegs 40μ long, tibia 10μ long, with seta arising close to base; tarsus 10μ long, claw 7μ long, curving down, slightly knobbed; featherclaw 4-rayed. Hindlegs 37μ long, tibia 8μ long, tarsus 9μ long, claw 10μ long. Coxae with some tubercles, the anterior coxae broadly connate. Abdomen with 60–65 rings, completely set with microtubercles, each microtubercle produced into a spinule; posterior rings broader and sharper dorsally in lateral view, slight ventrad doubling. Lateral seta 22μ long, on about ring

9; first ventral seta 60μ long, on about ring 22; second ventral seta 22μ long, on ring 40; third ventral seta 35μ long, on ring 6 from rear. Accessory seta present. Female genitalia 23μ wide, 14μ long, coverflap with 9–12 longitudinal furrows; seta 27μ long.

Male not seen.

Type locality: SACRAMENTO, CALIFORNIA. Collected: June 15, 1952, by the writer. *Host: Populus fremontii* Wats. (Salicaceae), Cottonwood. *Relation to host:* The mites live in the large pendant male catkin galls formed by *Aceria neossigi* (Keifer) and are inquilins in these galls. They inhabit the recesses at the base of the fasciated outgrowths from the catkins, browning the surfaces, and possibly contributing to the decline of the gall. *Type material:* A type slide and five paratype slides bear the above data.

All other California species of *Aceria* with 4-rayed featherclaws, have a much more distinct median line on the shield. The rear of the abdomen suggest the genus *Paraphytoptus*. In this case we have an Eriophyid mite which works against the best interests of another Eriophyid.

Aceria trichophila Keifer, new species

(Figures 4 da, 4 es, 4 f)

Female 200–230μ long, 35μ thick, a very slender species, light yellowish in color. Rostrum 20μ long, projecting ahead and down. Shield 27μ long, 25μ wide, median line present to rear; admedian lines strong, undulating, curving centrad slightly at rear margin; one prominent submedian line anteriorily, forking part way back into two additional lines of more or less clarity, and ending ahead of dorsal tubercles; sides of shield not granular. Dorsal tubercles 16μ apart, on rear margin; dorsal setae 23μ long, with seta; tarsus 6μ long, claw 8μ long, tapering; featherclaw 3-rayed. Hindlegs 30μ long, tibia 6μ long, tarsus 9μ long, claw 9μ long. Coxae somewhat tuberculate, the anterior coxae touching. Abdomen with 63–68 rings completely set with microtubercles, the microtubercles acuminate. Lateral seta 23μ long, on ring 4; first ventral seta 28μ long, on about ring 17; second ventral 10μ long, on about ring 31; third ventral 22μ long, on ring 5 from rear. Accessory seta present. Female gentialia 20μ wide, 15μ long, the coverflap with about 10–12 longitudinal furrows; seta 9μ long.

Male not seen.

Type locality: THREE MILES WEST OF SHINGLE SPRINGS, EL DORADO COUNTY, CALIFORNIA, NEAR HIGHWAY. Collected: June 29, 1952 by the writer. *Host: Quercus douglasii* H&A. (Fagaceae), Blue oak, a deciduous tree. *Relation to host:* The mites produce baggy erineum-filled leaf galls varying from $\frac{1}{4}$ to $\frac{1}{2}$ inch in size. *Type material:* A type slide and five paratype slides bear the above data.

This species with its 3-rayed featherclaws fits into the distinc-

tive Fagaceous-Juglandaceous group of species in the genus *Aceria*. The presence of a median line on the rear of the shield, together with strong admedian lines distinguishes *trichophila* from *mackiei* and *paramackiei*, the two similar oak mites already on the California list. The new species is notably slender. It is the first erineum mite to be described from a deciduous oak in California. At the date of the original collection, June 29, the erineum (or galls) contained many mites. On Aug. 12, 1952, the same tree showed that the mites had already abandoned the erineum. While the infested tree is in a considerable grove of the same species of oak no other tree showed evidences of infestation.

ACERIA ANSERINA Liro

(Figures 5 da, 5 es, 5 f)

Eriophyes anserinus Liro, Ann. Zool. Soc. zool-bot. Fen., Vanamo 9:12–13, 1943 (No. 3)

Eriophyes (Aceria) anserinus Liro, Liro and Roivainen in Animalia Fennica #6, p. 80, 1951 (in Finnish)

Locality: BODEGA BAY, SONOMA COUNTY, CALIFORNIA. Collected: Aug. 9, 1952 by J. P. Keifer, and the writer. *Host: Potentilla anserina* L. (Rosaceae), Silver-weed. *Relation to host:* The mites live among the dense silvery hairs on the undersides of the leaves. The host shows no damage.

The mite as it occurs in California is 200–250.. long and 50.. thick. The featherclaws are 5-rayed and the microtubes are rounded. On the shield the median line is represented by a series of dots on the rear half of the shield; the admedians are complete and flare outward at the rear; the submedians are of lines of dots or microtubercles and the first forks in front of the dorsal tubercles; the shield sides are entriely granular. No other species of *Aceria* known in California has the combination of a 5-rayed featherclaw and a median line composed of a row of dots.

Potentilla anserina L., silver-weed, has a holarctic distribution, coming down the Pacific Coast to Southern California. It is the only known host of *Aceria anserina*. Liro's figure, showing the flaring admedian lines, indicates the identification of this mite in California.

Eriophyes lithocarpi Keifer, new species

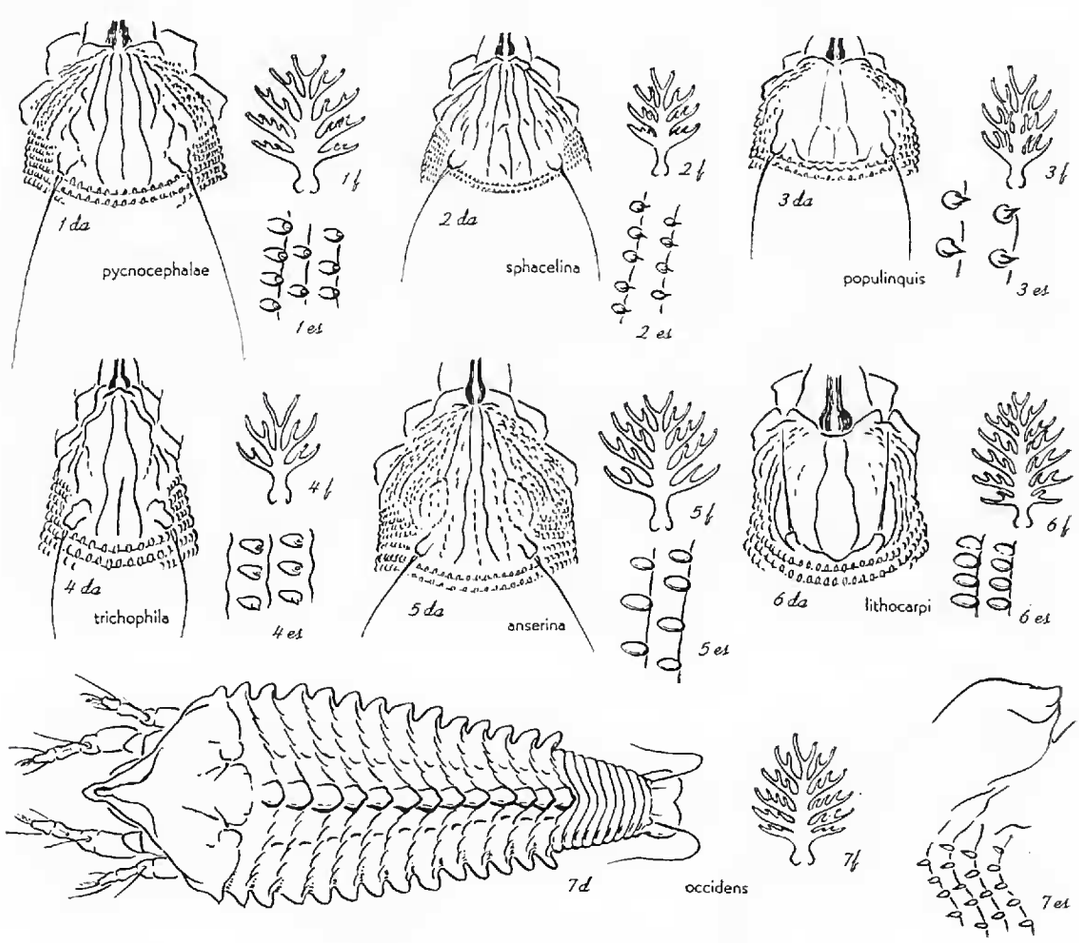
(Figures 6 da, 6 es, 6 f)

Female 150–180μ long, 35–40μ thick, wormlike, whitsh-yellow. Rostrum 27μ long, projecting forward and down. Shield 25μ long, 30μ wide; median line absent; admedians complete, subparallel, abruptly curving farther apart

just before middle, curving centrad at rear; sides of shield with lines curving out and forward from just below dorsal tubercles, and some granules below these. Dorsal tubercles 13μ apart, inclined forward from the rear margin; dorsal setae 22μ long, projecting up and forward. Forelegs 30μ long, tibia 7μ long, with seta; tarsus 8μ long, tapering; featherclaw 7-rayed. Hindlegs 25μ long, tibia 4μ long, tarsus 7μ long, claw 10μ long. Coxae with a few lines, the anterior coxae touching. Abdomen with 53–60 rings, the rings completely set with elongate, apically rounded microtubercles. Lateral seta 24μ long, on about ring 6; first ventral seta 30μ long, on about ring 16; second ventral 22μ long, on about ring 29; third ventral seta 18μ long, on ring 6 from rear. Accessory seta very small. Female genitalia 20μ wide, 11μ long, coverflap with a row of basal microtubercles and 12 to 14 longitudinal furrows; seta 8μ long.

Male 125μ long, 35μ thick.

Type locality: THE SOUTHWEST RIDGE ON MT. TAMALPAIS, MARIN COUNTY, CALIFORNIA. Collected: Aug. 3, 1952 by the writer.



EXPLANATION OF PLATE

d, dorsal view of mite; da, dorsal view of the cephalothoracic shield; es, diagram of the side skin structure; f, featherclaw.

Fig. 1, *Aceria pycnocephalae*. Fig. 2, *Aceria sphacelina*. Fig. 3, *Aceria propulinquis*. Fig. 4, *Aceria trichophila*. Fig. 5, *Aceria anserina*. Fig. 6. *Eriphyes lithocarpi*. Fig. 7, *Oxypleurites occidens*.

Host: Lithocarpus densiflora (H&A) (Fagaceae), Tanbark oak. *Relation to host:* the mites live around the buds, especially the terminal buds. They apparently do not harm their host. *Type material:* a type slide and five paratypes bear the above data.

This is the first California species of *Eriophyes* to be described that has a 7-rayed featherclaw. It is allied to some other California *Eriophyes* by the general features of the shield on which the lateral lines curve forward from below the dorsal tubercles and frame the shield center. This species is quite a contrast to the 3-rayed featherclaw members of *Aceria* that are normally found on Fagaceous trees. The explanation of the presence of this mite may possibly await the exploration of the Asiatic species of *Lithocarpus*.

Oxypleurites occidens Keifer, new species

(Figures 7 da, 7 es, 7 f)

Female 190–200μ long, 65–70μ wide, 45–50μ thick; fusiform in dorsal view; color in life reddish. Rostrum 30μ long, projecting down. Shield 55μ long, 60μ wide; anterior lobe projecting well over rostrum, spear-shaped apically, apparently grooved; central area of shield logitudinally raised. Dorsal tubercles 22μ apart, a little ahead of rear margin; dorsal setae 8μ long, projejcting diagonally ahead and up. Forelegs 36μ long, tibia 9μ long, with seta; tarsus 7μ long, claw 7.5μ long, tapering; featherclaw 6-rayed. Hindlegs 34μ long, tibia 7μ long, tarsus 6μ long, claw 7.5μ long. Coxae somewhat roughened with some tuberculation, the anterior pair but narrowly contiguous. Abdomen with 22 tergites, the first 13 of which form a serrate logitudinal middorsal ridge and have correspondingly projecting side teeth; the remaining 8 or 9 rings simple. Sternites about 70, narrow and closely set with microtubercles. Lateral seta 26μ long, on about sternite 8; first ventral seta 13μ long, on about sternite 26; second ventral 14μ long, on about sternite 46; third ventral seta 18μ long, on sternite 5 from rear. Accessory seta small. Female genitalia 26μ wide, 15μ long, coverflap basally with transverse roughenings and 9 or 10 longitudinal furows; seta 12μ long.

Male not seen.

Type locality: SANDY CAMP, HAT CREEK, SHASTA COUNTY, CALIFORNIA. Collected: Aug. 17, 1952, by the writer. *Host: Juniperus occidentalis* Hook. (Cupressaceae), Sierra Juniper. *Relation to host:* The mites are vagrants on the green branchlets, especially on vigorous tips. They are not common and apparently do no damage. *Type material:* a type slide and five paratype slides bear the above data.

No other species of *Oxypleurites* so far found in California has more than 4-rayed featherclaws. The new species bears a 6-rayed structure. The dorsal and lateral serrations ending abruptly at the 13th tergite are also definitive.

CALACARUS CARINATUS (Green)

Typhlodromus carinatus Green, in Insect Pests of the Tea Plant, 1890
Phytoptus theae Watt and Mann, The Pests and Blights of the Tea Plant, p. 366, 1903
Eriophyes carinatus (Green), Nalepa, Marcellia 25:133, 1929
Eriophyes carinatus (Green), King, Bul. Ent. Res. 28:311–14, 1937
Epitrimerus adornatus Keifer, Bul. Cal. Dept. Agr. 29:32, 1940
Calacarus adornatus (Keifer), Bul. Cal. Dept. Agr. 29:164, 1940
Calacarus adoratus (Keifer)., Bul. Cal. Ins. Surv. (UC), 2:41, 1952

This is the purple or ribbed tea mite of Asia. Nalepa, in the above cited reference considered that the names *carinatus* and *theae* were nude names and unusable taxonomically. This probably makes *adornatus* the first name proposed for this mite which was accompanied by an illustration of the mite. However, the writer feels that substituting *adornatus* for *carinatus* at this late date would only confuse the literature, and that therefore *carinatus* should stand. But it is necessary to correct the generic placement since the species is in no way related to the genus *Eriophyes*.

The genus *Calacarus* now contains four species. Two of these, *pulviferus* and *tejonis* are native on California oaks. *C. carinatus* has come to California on camellia from the orient. The additional species, *gei* Liro (Ann. Ent. Fenn. 8:77–78, 1942), occurs on *Geum rivale* L. in Finland. This latter species is very similar to *carinatus*. The species are all deep purple in color with longitudinal white wax stripes, and are beautiful mites if that adjective can be applied to Eriophyids.

The hosts of *Calacarus carinatus* are: tea *(Thea chinensis* L.) and camellia. In asia the mite is said to increase in numbers during dry periods. The long dry California summers are very favorable to the development of this mite.

This synonymy is possible through the help of Dr. A. M. Boyce, Director of the Citrus Experiment Station at Riverside, California. He arranged to have specimens of the purple tea mite sent to the writer from Ceylon. Dr. G. D. Austin, of the Tea Research Institute of Ceylon, sent the specimens, stating that they were collected at Talawakelle, November 26, 1952. Talawakelle is a hill station at 4500 feet elevation.

PLATYPHYTOPTUS SABINIANAE Keifer

Keifer, 1952, Calif. Insect Survey, Univ. Calif. Press, 2:53.

Prof. G. F. Knowlton, of the Utah State Agricultural College at Logan, has been active in the collection of pine Eriophyids. Due

to his efforts it is possible to report the first localities outside of California inhabited by *sabinianae*. The writer had previously supposed this mite to be confined to California, west of the Sierras, but Knowlton's work indicates it is widespread in Utah. His 1952 collecting records are:

Ogden, Dec. 23, on *Pinus nigra* Arnold, Austrian pine; Providence, Dec. 27, on *Pinus sylvestris* L., Scotch pine; Cove, Dec. 30, on *Pinus* sp.

SETOPTUS JONESI (Keifer)

Bull. Calif. Insect Survey, Univ. Calif. Press, 2:20, 1952

Prof. Knowlton collected this mite on limber pine, *Pinus flexilis* James, at Logan, Utah, Jan. 3, 1953. This is also the first collection of this mite outside of California.

DESCRIPTION OF A NEW SPECIES OF PHLOEOSINUS AND REMARKS REGARDING THE LIFE HISTORY AND HABITS OF RENOCIS HETERODOXUS CASEY

(Coleptera: Scolytidae)

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Blackman[1] recognized 40 species as members of the genus *Phloeosinus* in American north of Mexico—the great majority of which are found in the western United States. The members of the genus are commonly referred to as the "Cedar Bark Beetles" since all but three of the hitherto known forms attack cupressine or taxodiine trees. The species which do not conform to this general rule are *Phloeosinus pini* Swaine, which breeds in *Pinus strobus* and *P. banksiana;* and *Phloeosinus piceae* Swaine and *P. alaskanus* Blackman which breed in *Picea canadensis*.

It was a pleasant surprise, therefore, when the writer reared a considerable number of insects, belonging to this genus, from *Pseudotsuga taxifolia* in 1951. In April on a trip into southern Oregon an unusual number of red twigs were noted on Douglas fir saplings and reproductions. Believing this to be the work of *Cylindrocopturus furnissi* Buchanan, samples were brought into the laboratory and placed in breeding cages. As was expected, a large series of *C. furnissi* emerged in late May. The cages were

[1] Revision of the genus **Phoeosinus** Chapius in North America. Proc. U. S. Nat. Mus., 92:397-474, 1942, W. M. Blackman.